Classification of Effective Odor Mitigation Techniques

College of Agriculture and Life Sciences Air Quality Team

Iowa State University

Odor Mitigation Methods Classified as having Information Gaps and Needing Further Research

GAPS IN TECHNOLOGIES NEEDING FURTHER RESEARCH			
Method	Description	Known	Unknown
Barriers	Sometimes called a "windwall". This is a wall of plastic or other material that forces the air leaving fans vertically.	• Removes particulate matter • Localized dispersion	• Impact further downwind where receptors are located • Quantification of PM removal
Biocurtain	Barrier with electrostatic precipitator	• Removes particulate matter • Antidotal information	• Quantification of PM removal • Impact on downwind receptors
Diet Manipulation (poultry)	Reduced crude protein level of nutritionally balanced diet; incorporation of certain feed additives into diet	• 10 to 40% ammonia reduction	• Quantification of odor reduction • Complete economic analysis
Manure Belt (layers)	Use of a manure belt to remove manure to a storage shed on a frequent basis vs.the more common practice of manure storage in a high-rise house and removed once a year.	• 80% ammonia reduction • 50% more expensive to build (MB houses)	• Quantification of odor reduction • Quantification of PM reduction
Manure separator scraper (swine)	Separates liquid and solid manure immediately after excretion.	• Reduces NH3 • Reduces H2S • Limited manufacturers currently	• Quantification of odor reduction
UV degradation	Use of UV light to degrade odorous compounds	• Strong odor reduction	• Tested on lab. Scale-up and pilot study needed.
Bio-scrubbers	Single or multiple stage filtration or treatment of odor/gases/PM-laden exhaust air	• Appreciable odor and gaseous reductions based on ongoing field evaluations in Europe	• On-farm evaluation under US/Iowa production conditions • Evaluation of system longevity, operational costs under US production conditions • Compete economic analysis

Topical application of certain treatment agents to manure storage	Application of certain chemical or natural treatment agents to manure storage (e.g., manure storage associated with the manure belt system, zeolite)	• Lab-testing has shown appreciable reduction in odor and gases of (laying hen) manure storage	• On-farm verification of efficacy and determination of application frequency • Design and testing of a mechanical system to apply the treatment agents • Complete economic analysis
Dietary Manipulation	Including: Manipulation of gut micro flora, addition of low levels of fermentable nonstarch polysaccharides, pH and buffering feed additives.	• Preliminary work shows ammonia reductions are typical.	• Odor documentation related to intensity and hedonic tone are not widely reported. • Evaluation of performance must be a part of an study.